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| 10/692,668 | 10/24/2003 | Naveen Bali | 5693P033 | 9966 |
| 48102 7590 09/28/2007 NETWORK APPLIANCE/BLAKELY 1279 OAKMEAD PARKWAY SUNNYVALE, CA 94085-4040 | | | EXAMINER ALAM, SHAHID AL | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/692,668

Applicant(s)

BALI ET AL.

Examiner

Shahid Al Alam

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2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 24-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 8, 24-26, 29-33 and 35 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 27, 28 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

1. Claims 1 – 8 and 24 – 35 are pending in this Office action.
2. The request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for Continued Examination under 37 CFR 1.114, the fee set forth in 37 CFR 1.17(e) has been paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 July 2007 has been entered. An action on the RCE follows.

Response to Arguments

3. Applicant's arguments filed July 13, 2007 have been fully considered but they are not persuasive.

Applicant argues that the log entries in Voigt are different from the log entries described and claimed in the present application; Voigt does not discuss write request at all; and Voigt writes log entries to disk, overwriting older entries.

Examiner respectfully disagrees all of the allegations as argued.

First, Applicant argues that the log entries in Voigt are different from the log entries as claimed. Applicant explained in page 7 of argument is that Voigt teaches improving performance by posting partially-filled log pages to the least busy of a group of disks, while Applicants' invention relates to the content and format of individual entries in a log, where the entries themselves pertain to a particular occurrence in a storage server. In short, Voigt is concerned with where and when to store log entries, while Applicants' invention is concerned with what to record in the log, and how to

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format it. Nowhere in the claim language teaches “the content and format of individual entries in a log, where the entries themselves pertain to a particular occurrence in a storage server” and nowhere in the claim language teaches “what to record in the log, and how to format it”.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “the content and format of individual entries in a log, where the entries themselves pertain to a particular occurrence in a storage server” and “what to record in the log, and how to format it”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Second, Applicant argues that Voigt does not discuss write request at all; and Voigt writes log entries to disk, overwriting older entries. Examiner is confused because Applicant argues that Voigt does not discuss write request at all and then he argues that Voigt writes log entries to disk. Applicant's argument contradicts. Nevertheless, for the clarity purposes, Voigt teaches data storage system that includes a memory map store that provides for persistent storage for the virtual mapping information used to map disk array, which indicates there is a write operation. Voigt also teaches Sequence number is a generated number that is **sequentially incremented** for each new record added to the transaction log that is log entries are not overwritten older entries.

In view of the above, the examiner contends that all limitations as recited in the claims have been addressed in this Action and the rejection is hereby sustained.

Drawings

4. The informal drawings are not of sufficient quality to permit examination. Accordingly, replacement drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to this Office action. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 8, 24 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Number 6,055,604 issued to Douglas Voigt et al. (hereinafter "Voigt").

With respect to claims 1 and 24, Voigt teaches maintaining a log of a plurality requests in a storage server (column 4, lines 42 – 54),

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each of the requests corresponding to a storage operation to be performed by the storage server on a set of storage devices, the log including a separate log entry for each of the requests (Figure 7 and column 2, lines 56 – 60 and column 3, lines 40 – 42); and

including a separate checksum in each of the log entries, each checksum for use by a checksum algorithm in determining data integrity of the corresponding log entry (Figure 7, item 135 and column 8, lines 15 – 32).

As to claim 2, the requests originate from a set of client devices serviced by the storage server (column 3, lines 40 – 42 and column 4, lines 25 – 29).

As to claims 8 and 30, maintaining an entry count in the log to indicate the number of log entries in the log (Figure 7, item 120); and

using the checksum of one of the log entries to determine whether the entry count is corrupted (column 9, lines 15 – 26; checking the entry's checksum for corruption of the record entails a check of all of the data of the record, which includes the sequence number).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 4, 7, 25, 26, 29, 31 – 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Voigt and further in view of U.S. Patent Number 6,880,149 issued to Paul Cronic ("Cronic").

As to claims 3 and 25, Voigt teaches claimed invention substantially as claimed, however, Voigt does not explicitly indicate selecting the checksum algorithm based on a desired balance between performance and checksum strength as claimed.

Cronic teaches claimed selecting the checksum algorithm based on a desired balance between performance and checksum strength (Cronic: column 5, lines 33 – 36 and column 6, lines 56 – 58).

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify the teachings of Voigt with the teachings of Cronic to have used a dynamic selection schema for choosing the currently most suitable checksum algorithm for use in the log. One of ordinary skill in the art at the time of invention would have been aware of the tradeoffs involved in using any single

checksum algorithm and thus knowing that the loading of a storage system would be highly variable, and only predictable to a limited extent. Combination would allow the application to validate code base integrity during normal execution, and allow the programmer to place the validation code in multiple locations within the code base. The programmer is also allowed to customize validation code to prevent location using pattern-matching searches (Cronce: column 2, lines 15 – 25).

As to claims 4 and 26, Voigt teaches claimed invention substantially as claimed, however, Voigt does not explicitly indicate automatically selecting the checksum algorithm based on a predetermined criterion as claimed.

Cronce teaches claimed automatically selecting the checksum algorithm based on a predetermined criterion (Cronce: column 6, lines 5 – 8; a preference setting is a form of a predetermined criteria).

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify the teachings of Voigt with the teachings of Cronce to have used a dynamic selection schema for choosing the currently most suitable checksum algorithm for use in the log. One of ordinary skill in the art at the time of invention would have been aware of the tradeoffs involved in using any single checksum algorithm and thus knowing that the loading of a storage system would be highly variable, and only predictable to a limited extent. Combination would allow the application to validate code base integrity during normal execution, and allow the programmer to place the validation code in multiple locations within the code base. The

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programmer is also allowed to customize validation code to prevent location using pattern-matching searches (Cronce: column 2, lines 15 – 25).

As to claims 7 and 29, Voigt teaches claimed invention substantially as claimed, however, Voigt does not explicitly indicate a separate algorithm variable in each of the log entries, to specify a checksum algorithm to be used separately for each said log entry as claimed.

Cronce teaches claimed a separate algorithm variable in each of the log entries, to specify a checksum algorithm to be used separately for each said log entry (Cronce: column 5, lines 16 – 25 and 23 – 25; see also Figure 4b, item 420).

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify the teachings of Voigt with the teachings of Cronce to have used a dynamic selection schema for choosing the currently most suitable checksum algorithm for use in the log. One of ordinary skill in the art at the time of invention would have been aware of the tradeoffs involved in using any single checksum algorithm and thus knowing that the loading of a storage system would be highly variable, and only predictable to a limited extent. Combination would allow the application to validate code base integrity during normal execution, and allow the programmer to place the validation code in multiple locations within the code base. The programmer is also allowed to customize validation code to prevent location using pattern-matching searches (Cronce: column 2, lines 15 – 25).

As to claim 31, Voigt teaches claimed invention substantially as claimed, however, Voigt does not explicitly indicate the storage appliance is a network appliance as claimed.

Cronce teaches claimed indicating the storage appliance is a network appliance (Cronce: column 11, lines 37 – 41).

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify the teachings of Voigt with the teachings of Cronce to have used a dynamic selection schema for choosing the currently most suitable checksum algorithm for use in the log. One of ordinary skill in the art at the time of invention would have been aware of the tradeoffs involved in using any single checksum algorithm and thus knowing that the loading of a storage system would be highly variable, and only predictable to a limited extent. Combination would allow the application to validate code base integrity during normal execution, and allow the programmer to place the validation code in multiple locations within the code base. The programmer is also allowed to customize validation code to prevent location using pattern-matching searches (Cronce: column 2, lines 15 – 25).

With respect to claim 32, Voigt teaches receiving a plurality of storage requests from at least one client (column 3, lines 40 – 42; column 4, lines 25 – 29 and column 8, lines 51 – 56);

preparing a plurality of log entries, each log entry of the plurality of log entries corresponding to one storage request of the plurality of storage requests (Figures 7 and

8; column 8, lines 15 – 27 and 47 – 56), and each log entry including a checksum of the log entry (Figures 7, item 135 and column 8, lines 15 – 32); and

storing the plurality of log entries in a non-volatile random access memory ("NVRAM") (column 4, lines 34 – 38 and column 8, lines 51 – 55).

Voigt does not explicitly teach operating a network-accessible data storage server as claimed.

Cronce teaches claimed teach operating a network-accessible data storage server (Cronce: column 11, lines 37 – 41).

It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to modify the teachings of Voigt with the teachings of Cronce to have used a dynamic selection schema for choosing the currently most suitable checksum algorithm for use in the log. One of ordinary skill in the art at the time of invention would have been aware of the tradeoffs involved in using any single checksum algorithm and thus knowing that the loading of a storage system would be highly variable, and only predictable to a limited extent. Combination would allow the application to validate code base integrity during normal execution, and allow the programmer to place the validation code in multiple locations within the code base. The programmer is also allowed to customize validation code to prevent location using pattern-matching searches (Cronce: column 2, lines 15 – 25).

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As to claim 33, preparing a log header containing a count of the plurality of log entries (Figure 7, item 120); and storing the log header in the NVRAM (column 4, lines 34 – 38 and column 8, lines 51 – 55).

As to claim 35, computing a checksum of the log header and storing the checksum with the log header in the NVRAM (column 8, lines 28 – 32 and 51 – 56).

Allowable Subject Matter


7. Claims 5, 6, 27, 28 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shahid Al Alam whose telephone number is (571) 272-4030. The examiner can normally be reached on Monday-Thursday 8:00 A.M.- 4:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Shahid Al Alam
Primary Examiner
Art Unit 2162

September 25, 2007